STUDY PROJECT

AMMUNITION SUPPORT FOR OPERATION DRAGOON, THE INVASION OF SOUTHERN FRANCE-- COULD WE DO IT TODAY?

BY

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23 MARCH 1987

US ARMY WAR COLLEGE, CARLISLE BARRACKS, PA 17013

ABSTRACT

AUTHOR: James W. Boddie, Jr., LTC, OD

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USAWC MILITARY STUDIES PROGRAM PAPER

AMMUNITION SUPPORT FOR OPERATION DRAGOON, THE INVASION OF SOUTHERN FRANCE-- COULD WE DO IT TODAY?

A Study Project

by

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PRELUDE

"The first essential condition for an army to be able to stand the strain of battle is an adequate stock of weapons, petrol and ammunition. In fact, the battle is fought and decided by the quartermasters before the shooting begins. The bravest men can do nothing without guns, the guns nothing without plenty of ammunition, and neither guns nor ammunition are of much use in mobile warfare unless there are vehicles with sufficient petrol to haul them around."[1]

Field Marshal Rommel

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INTRODUCTION

Operation DRAGOON, the invasion of southern France, was initiated on 15 August 1944. At the time of the invasion, the United States was in the midst of global operations that made supporting a new front a major challenge. US forces were actively fighting in Normandy, Italy and the Pacific. The invasion of southern France offers us the opportunity to study the challenges of logistically supporting a "new" front while being decisively engaged in other theaters.

The intent of this program is to take a historical look at ammunition support for the DRAGOON operation, look at some of the lessons of that operation, and relate those lessons to today's Army and whether we could support a similar operation today.

BACKGROUND

The invasion of southern France, first code-named ANVIL and later changed to DRAGOON (which it will be called hereafter in this paper), was a major controversial issue during the planning for the invasion of France. DRAGOON was originally planned as an operation in conjunction with the main invasion, OVERLORD, at Normandy. However, the two operations could not be supported simultaneously because of the shortage of landing craft (see definition at Enclosure 1). General Eisenhower, the Supreme Allied Commander, recognized that the invasion of southern France was essential even after the successful OVERLORD landings. He recognized that France was the decisive theater in Europe, and that a rapid concentration of the maximum forces against the enemy there could be achieved only be seizing another major port. General Eisenhower cabled to General Sir Henry Maitland Wilson, the Supreme Commander in the Mediterranean, in July 1944 (the Comander responsible for the initial phases of DRAGOON) giving General Wilson his senior commander's intent for operation DRAGOON as follows:

1. Contain and destroy enemy forces which might overwise oppose OVERLORD.

2. Secure a major port in southern France for entry of additional allied forces.

3. By advancing northward, to threaten the southern flank and rear communications of the enemy forces opposing OVERLORD.

4. To develop lines of communication for the support of his own (Wilson's) advancing force (DRAGOON) and for the development

and support of additional forces to be introduced through the port as reinforcements for his own command.[2]

General Omar Bradley, the Commander of 12th Army Group, part of the OVERLORD operation, stated that "In addition to clearing the enemy out of southern France, ANVIL (DRAGOON) would open up an additional line of supply from the port of Marseilles, up the Rhone Valley; to Alsace."[3]

The bottom line was that the ports and transportation facilities in northern France were inadequate to receive and maintain the forces scheduled for OVERLORD--therefore, the port of Marseilles became logistically essential to the invasion and ultimate defeat of Nazi Germany from the west. After the successful invasion of southern France, divisions that were scheduled to be brought into Europe through northern ports were diverted to Marseilles and supported from the south. This freed-up the ports in northern France to barely be able to sustain the forces operating in the north.

There was considerable debate on whether to launch DRAGOON or not. The British did not want to open the new front because they did not want to reduce the effort in Italy. The final approval to launch DRAGOON took President Roosevelt's intervention with the British. The invasion of southern France, commonly referred to as the second D-Day, finally took place on 15 August 1944. The key point here is that logistical necessity was a major driving factor that led General Eisenhower to persist in having the DRAGOON operation.

When we look at logistics in a major combat operation, we quickly see that we have to move more ammunition than any other class of supply. Both in DRAGOON and the OVERLORD operations, planners allocated fifty percent of the shipping capabity to ammunition. The 1944 version of FM 9-6, Ammunition Supply, described the importance of ammunition supply as: "Adequate and timely supply of ammunition to combat troops is indispensible to the successful prosecution of any military operation. No other single item of supply is so vital to combat."[4] The DRAGOON operation offers us an excellent campaign to study ammunition logistics.

The plans for DRAGOON called for landings at three beaches between Toulon and Nice--ALPHA (Cavalaire-Sur-Mar), DELTA (St. Tropez), and CAMEL (St. Raphael). The plan was then to capture the major ports of Marseilles, Port de Bouc, and Toulon. Marseilles, the leading port of France, had an artificial harbor that was secure in all weather and was completely serviced by rail and had canal connections to the Rhone River. It had a peacetime discharge capacity of 20,000 tons per day. Toulon had a capacity of 10,000 tons per day but was limited by port discharge facilities. Port de Pouc was primarily a fuel handling facility with excellent handling equipment. The problem was the uncertainty of how much damage to the ports and transportation network would be done by the allied bombing or by the Germans. The capture of the Normandy ports had been difficult and when finally captured, the Germans had virtually destroyed them. The plans called for landing 500,000 soldiers in southern France (eventually over 900,000 were landed,

see chart at Enclosure 2). Class V planning called for the following schedule based upon projected heavy fighting against the German 19th Army:

D-Day: Five units of fire (see definition at Enclosure 1) to accompany all troops.

D+5: Five units of fire for troops landing that day + 3 1/3 units of fire for maintaining troops previously landed.

D+10: Five units of fire for troops landing + 1 2/3 units of fire for all troops previously landed.

D+30: Total reserve buildup of 58,500 tons on beachdumps.[5]

Approximately one-half of the ship tonnage allotted was scheduled for Ordnance Class V items.

Additionally, the plan called for airborne drops behind the beaches. For the first time, airborne ordnance men were planned to support the operation. Although primarily for conventional maintenance (support of vehicles, artillery pieces, and small arms), there was a two-man airborne team to operate ammunition points after collecting parachute dropped and glider landed ammunition. These ordnance soldiers landed early on D-Day in gliders.

The landings on the three beaches, beginning at 0800 hours, 15 August 1944, by the 7th US Army, consisting of three crack US Infantry divisions from the Italian campaign (3rd, 36th, and 45th) and selected French forces, were remarkably successful, encountering relatively light enemy resistance. The German 19th Army was located in southern France with eight divisions. This force, had it been at full strength and trained and ready to fight, could have been a formidable foe. The divisions, however, were not in a high state of readiness as indicated below:

Condition of German Divisions
in Southern France[6]
(15 August 1944)

Division	Condition
716	50% effective; after heavy losses at Normandy, sent south to refit.
198	Satellite forces recently sent from Eastern Front.
189	Weak.
338	Largely limited service personnel, recently four battalions sent to Normandy.
242, 244	85% strength.
148, 157	Reserve divisions, full strength, relatively powerful.
11th Panzer	Only genuinely mobile division, had seen service in Russia.

The assault quickly penetrated coastal defenses and 7th Army raced up the Rhone River Valley in pursuit of disorganized enemy forces.

Ammunition supply activities commenced shortly after H-hour on D-Day with the employment of six ordnance ammunition companies (all landed on D-Day). Three companies were designated to operate four main beach dumps and three were scheduled to support the combat divisions as they moved forward. Initially all six companies had to work the beach dumps under control of Engineer combat regiments that controlled all beach activities. During World War II, the Army had Engineer Beach Groups composed of Engineer Combat Regiments. These organizations had a range of missions from clearing obstacles and mines on the beaches and controlling traffic coming in and going out from the beaches, to establishing "beach dumps" for supplying the Armies. As at OMAHA and UTAH

beaches during the OVERLORD operation, ammunition was discharged from ships anchored offshore into amphibious trucks (DUKW's, see definition at Enclosure 1) and Navy ferry craft. In order to provide for the quick turn-around of DUKW's, ships' anchorages and dumps were kept close to the shore line. Motor cranes, "A" frames (see definition at Enclosure 1) mounted on DUKW's, and other devices were used to transfer cargo at the shore and at the dumps.

Ammunition was slow coming ashore because of gasoline shortages for the DUKW's during the first day of the operation. Although there was plenty of gasoline planned to support the DRAGOON operation, on the first day it was difficult to get it to places where it was needed--like to fuel DUKW's on the beach. As unloading speeded up, the ammunition companies were swamped with receipts; as many as 200 DUKW's were awaiting unloading at one time. Unloading, storage, and issue were complicated by use of cargo nets in the DUKW's which contained more than one type of ammunition. Numerous problems were encountered that kept tonnage discharge behind schedule. One of these problems was that cargo ships had been top-stowed with ammunition. Since the anticipated initial heavy combat did not materialize and the tactical forces advanced more rapidly than had been expected, the demand for gasoline and rations became more urgent than that for ammunition. As a result, it became necessary to double and triple handle ammunition in order to get it out of the way of more urgently needed supplies stowed below.

By D+3, ammunition troops were near exhaustion and at this stage of the operation, civilian labor was difficult to obtain. By D+7, three ammunition companies were moved from the beach dumps and attached one to each Infantry division. They operated division Ammunition Supply Points (ASPs, see definition at Enclosure 1) and, while not under Army ordnance control, were supplied Army transport. This system, while unorthodox, functioned satisfactorily because of the extremely rapid forward movement of the battle.

During the assault phase, French forces were also supplied ammunition by American troops, however, French troops took over the actual operation of ASPs as soon as was possible. The 7th US Army ordnance ammunition battalion was charged with supporting this combined operation by providing the central and supervision of French ammunition installations as long as French forces were under 7th Army control (prior to activation of 6th Army Group on 15 September 1944 which provided command and control over 7th US Army and the 1st French Army.

Sufficient ammunition to support 7th Army operations was received over the beaches but transportation was not available to move it forward. The situation became so critical that an ammunition company was converted into a truck company by diverting vehicles from Army ordnance stocks. This company was designated to haul ammunition exclusively and was always under control of the Army ordnance officer.

On 28 August 1944, only 13 days after the landings, the major ports of Marseilles and Toulon were captured by the French.

Although the Germans did major damage to the ports and railroad network, the Army Engineers and French civilians quickly made major repairs. The railroad lines to the north up the Rhone River Valley had 42 bridges that had to be rebuilt as well as numerous tunnels that had to be cleared and/or repaired. By early October, both the ports and the rail net were capable of handling more than other shortfalls would allow. A shortage of Service personnel and limited transportation were the major shortfalls. Although the Military Railroad Service, with tremendous assistance from French railway officials, was able to get the railroads in the Rhone Valley operating much faster than expected, a shortage of railway cars and service personnel to unload them contributed to the failure of transportation to meet expected goals. Railroad cars and engines were shipped from the United States to fill some of the shortages, however, southern France was in competition for these scarce commodities with northern France which had even more severe shortages. In addition, the operations in France moved so rapidly that a critical shortage of trucks resulted by October. This further contributed to transportation problems. By 16 October, an estimated 70,000 tons of supplies were awaiting movement from Marseilles.

All ammunition issues to combat troops were for replenishment of basic loads, although 7th Army did not publish a basic (prescribed) load (see definition at Enclosure 1). Field storage was employed for beach dump sites and for all ASPs until mid-September. When inclement weather set in, roadside storage was adopted and

maintained until the cessation of hostilities. Difficulty was experienced in locating adequate road nets that were not too dispersed and that would not interfere with the tactical movement of troops. The 7th Army instructed its ammunition companies employing roadside storage to place 50-ton stacks at 50 yard intervals, rather than small stacks at lesser intervals as was general practice. It was felt that in case of fire, larger stacks and greater safety distances would lead to fewer losses and be easier to control.[7]

The major problem in ammunition supply through the Southern Line of Communication (SLOC) involved the long lines of communication. By 15 September 1944, only 30 days after D-Day, 7th US Army and French forces, both now under 6th Army Group, had advanced some 400 miles. The original plan for phasing in supplies proved inadequate because of extended supply lines and shortage of transport. At this time, 6th Army Group endeavored to regroup troops and build up forward supply points. To accomplish this, tonnage allocations (see definition at Enclosure 1) were assigned to the Armies. A System of ammunition credits (see definition at Enclosure 1), based on actual availability, became necessary to apportion the critically short supply of ammunition in forward areas. The 6th Army Group instructed its supply agency, SLOC, as to the ammunition to be shipped to each Army.

Ammunition accounting and administration changed throughout the operation. As in the assault on the Normandy beaches, unit of fire (see definition at Enclosure 1) figures were used in

DRAGOON for initial planning and shipping of ammunition. Accurately predicting ammunition useage rates was a problem that never was solved. At the termination of the assault phase, resupply was based on day of supply (see definition at Enclosure 1) figures for the North African theater of operations. Later when 6th Army Group came under control of the European Theater of Operations, the day of supply for the European theater was employed. Significantly different quantities were required for the assault, the breakout, and when the Armies faced the formidable German "west wall." Quantities experienced during OVERLORD were not experienced during DRAGOON. Slightly different methods of operation, plus language difficulties, caused complications in accounting and administration of the French army ammunition supply. French troops transported, stored, and issued their own ammunition, but the 7th US Army Ordnance ammunition battalion (on 1 September 1944, the ammunition companies were relieved from direct support of the infantry divisions and placed under control of the 62d Ordnance Battalion) was responsible for superision of operations and preparation of status of stocks reports (see definition at Enclosure 1). Liaison was poor during the period that French forces were under 7th Army and adequate records were not maintained.

Throughout the European campaign, there were always a few types of ammunition that were critical and the scarcity of these types imposed requirements for extreme accuracy in accounting and administration. Because the personnel assigned to ammunition companies were generally in the lower three categories of the Army

General Classification Test Groups, they were not capable of accurate stock control. The inability of ammunition companies to accurately account for ammunition, especially critical types, caused a reduction of efficiency. Ammunition companies were not trained and conditioned to operate under conditions of peak activity often required of them, especially during periods of bad weather and short daylight hours. Civilian labor, speaking many foreign languages, could not be supervised with maximum efficiency by ammunition personnel of limited intelligence and practically no knowledge of languages other than poor English. In many cases ammunition that was on hand could not be issued because it was not properly accounted for and the ammunition companies did not know it was there.

By October 1944, the entire European theater was experiencing ammunition shortfalls, especially artillery ammunition (105mm howitzer M1, 4.5-inch gun, 155mm howitzer, 155mm gun self-propelled, 155mm gun M1, 8-inch howitzer, 8-inch gun and 140mm howitzer). Although by this stage of the European campaign, Operation DRAGOON had been successfully completed, a brief look at the causes of the October crisis is necessary. The crisis resulted from the following.

a. Although the SLOC port discharge problems had, for the most part, been resolved, there were still major problems in northern France. Most of the European theater was being supported through northern French ports. Even in October, a large part of the ammunition coming into northern France was still coming in

over the OMAHA and UTAH beaches (see chart at Enclosure 3). The major port in the north, Antwerp, had still not been captured and the Schelde River cleared so it could be used (Antwerp did not start being used until November 1944--but by January, it exceeded the southern France ports in tonnages discharged). Until Antwerp was operational and the railroads repaired, meeting supply requirements was difficult.

b. The rapid advance in the armies created lines of communication (LOC) in excess of 400 miles in some cases, and when the armies had fully extended the LOCs, they ran into their toughest opposition--the "west wall." Much of the French railway system had been destroyed either by our strategic bombing or by retreating Germans. There was a shortage of supply vehicles that was magnified as the LOCs were extended. Ammunition companies had no organic vehicles to move ammunition. Ammunition was just not being moved forward in the quantities needed in a timely manner. Ammunition logistics had reached its logistics culminating point.

c. Ammunition rates were changing--combat units needed more bullets in order to breach the "west wall" than they had required for the breakout and pursuit, yet logistics follow-up planning at the theater level had not taken this into account and plans were not flexible enough to rapidly adapt to this changing situation.

SUMMARY OF THE DRAGOON OPERATION

Although the DRAGOON Operation has to be considered a success, the Southern Line of Communication was unable to provide the surplus capacity which, it had been hoped, would enable it to aid

in support of the 12th Army Group. General Eisenhower had hoped to be able to supply all forces south of the Luxembourg area from the southern French ports. By mid-September, however, the southern line of communication was able to relieve some of the strain on the attenuated lines of the 12th Army Group. The transfer of XV Corps to 6th Army Group relieved General Patton of the burden of resupplying and supporting 50,000 troops. By 21 October, the southern line of communication was supporting 16 allied divisions (8 US, 8 French) and continued to expand its support until by 8 January 1945, it was supporting 22 divisions (13 US, 9 French). These 22 divisions represented one-third of the total allied divisions committed to combat at that time. It is significant to note that the six US divisions debarking in Marseilles in October and December were committed to combat within two weeks, whereas five of eight divisions landing in northern France in September were not committed until five to six weeks later as a result of transportation and logistics dificulties. So, from an operational standpoint, DRAGOON permitted the "accelerated unfolding of combat power."

General Eisenhower's concern for adding the ports of southern France to his supply lines was well justified. Not only did the forces and supplies coming through southern France enable the Supreme Allied Commander to consolidate his position in late 1944, but it is unlikely that allied forces in France would have been able to mount their final offensive into Germany in 1945, without the heavy contribution of ammunition and other supplies shipped

through southern France. One-fourth of the total allied buildup prior to VE Day came through southern France. By September, the ports of southern France became the leading tonnage supplier of SHAEF (see definition at Enclosure 1) forces and continued to handle the largest tonnage until March 1945, when Antwerp reached full capacity[8] (see chart at Enclosure 3).

LESSONS LEARNED RELATED TO 1987

Ammunition Rates

"There are numerous rates used for different purposes--procurement, distribution, force structure, transportation and so on. Ammunition rates are the key to the ammunition logistics system. Until the logistician knows the combat commander's requirements, he cannot peroperly develop storage requirements, movement requirements, force structure, or resupply requirements."[9]

Throughout the DRAGOON Operation, accurately identifying ammunition requirements hampered ammunition supply operations. From the initial landings where light combat was experienced to reaching the "west wall," requirements changed that influenced the requisitions to CONUS as well as resupply operations to the combat units. The initial logistical bottleneck was due to too much ammunition stored on top of ships to support the "assault" that was not needed. The War Department had established rates that did not reflect the needs of the combat commanders.

Have we solved the ammunition rate problem in the 42 years since the war? The answer is no--in fact, the ammunition rate problem is a major issue at the highest levels of our Army today.

Current rates for a divisional slice (less MLRS) and their sources are as follows:

USAREUR Staff	3,000 S-tons/day
USAREUR Corps Commanders	4,500 S-tons/day
Logistics Center	1,500 S-tons/day
Concepts Analysis Agency	1,500 S-tons/day
Missile and Munitions Center and School	3,500 S-tons/day
Combined Arms Combat Development Activity (CACDA)	(due out--expected during the summer of 1987)

As can be seen above, there is a significant variation between the various rates for a division. The impact of this is major. Ammunition consumption rates are a major input to Force Analysis Simulation of Theater Administrative/Logistics Support (FASTALS) which is used in developing combat support and combat service support unit requirements. When this project was initiated, one of the objectives was to look at the number of ammunition units in the force structure to see if the Army had enough ammunition companies to support an operation of the magnitude of DRAGOON while conflict was on-going in another theater. This is not possible with the current consumption rate variations. The United States Army, Europe may lose some ammunition units from their force structure this year because of the differences in ammunition rates.

In April 1982, a US Army War College student, Lieutenant Colonel Benson F. Landrum, did a student essay titled An Analysis of the Army Conventional Ammunition Rate Studies. The problem statement of the essay was that there are various conventional ammunition rate studies being conducted by Army agencies that are

not based on common input data. The conclusion and recommendation of Lieutenant Colonel Landrum's paper was to coordinate into a single proponent agency (ODCSOPS) the computer equipment and personnel in order to produce one accurate rate study. This still needs to be done. The student essay pointed out a major Army problem in 1982 that at least goes back to 1944 yet remains uncorrected.

VOLUME

Pre-invasion plans called for 250 tons of ammunition per division slice per day. Experience for the European theater showed that a division slice expended approximately 175 tons of ammunition a day. As indicated in the discussion on ammunition rates (above), the current rates for a division slice range from 1,500 short tons to 4,500 short tons, a dramatic increase when compared to World War II. Enclosure 3 is a breakout of major weapon logistics and firing rates of a 1945 infantry division compared to a division-86 Mech-Infantry division. Major differences are obvious, but consider ammunition requirements. Two of the 155mm self-propelled howitzers in Division-86 will fire more tonnage per day during intense combat than the 75 howitzers in the 1945 division fired during a normal day. Over an extended period of time, one section (4 guns) of a heavy Division-86 155mm battery will fire more tonnage per day than all the artillery in the 1945 division.[10] The chart below gives a synopsis of the increase in tonnage since World War II required to support a divisional slice on a daily basis.

DIVISIONAL SLICE DAILY AMMUNITION REQUIREMENT[11]

Time	S-Tons
World War II	175
Vietnam	250
Tasta 70	600
1983 (MS_3)	3,400
DIV-86	4,500*

*Varies from 1,500 to 4,500, depending on source--less MLRS.

Logisticians had a difficult time in supplying required quantities of ammunition to combat units during the DRAGOON Operation. They were for the most part successful. They initially brought ammunition across the beaches, then were able to use harbors. They had railroads and trucks to move the ammunition forward. A division slice consumed approximately 175 short tons of ammunition a day. One thing for sure is that consumption rates will be higher, from 8 to 25 times as high depending on which to today's rates you accept. The question is, will tomorrow's battlefield have harbors, railroads, or highways? There are many potential battlefields in Southwest Asia and Central America that do not have these "necessities." With the large quantities of ammunition that must be moved, our whole ammunition logistics system would be severely hampered by lack of harbors, railroads, or highways. FM 9-6, Ammunition Service in the Theater of Operations, dated January 1984, states on page 34 that, "Upon arrival in the theater, ammunition is moved through fixed ports." This implies that the Army is not considering or even training for moving ammunition in over the shore——the most likely scenario in a Southwest Asia or Central America conflict.

Another major factor not included in this project is the Multiple Launch Rocket System (MLRS). The tonnages used are all less MLRS. MLRS rockets are to be handled through "another system." The fact is that MLRS represents a major challenge. Although the tonnages are not that high, the volume or bulk is. MLRS will be a major competitor for truck and rail space. It is a major factor in the overall volume increase that has taken place since World War II. This increase in the large amount (volume) of ammunition we can expect to use in future wars is a tremendous increase in both tonnages and bulk compared to anything we have known in the past. It represents many ship, train and truck loads of ammunition and a heck of a lot of soldiers/civilians to load and unload it. It creates major stock accounting and security challenges.

Additionally, not included in this study, is the impact of precision guided munitions. There has been a proliferation of new types of munitions that will require added security, in some cases, speical handling, and create the major problem for ammunition logisticians of how we get the right munition to the right gun in a timely manner.

CONTAINERIZATION/MATERIAL HANDLING EQUIPMENT

During the DRAGOON Operation, all ammunition came in as breakbulk cargo. Today, containerized ammunition shipments are increasing. It is estimated that in event of war, 60 percent of all ammunition will be shipped in ammunition containers. More resupply cargo must move by containerships since available

breakbulk and RO/RO (see definition at Enclosure 1) type ships will be required for the movement of unit equipment and non-containerizable cargo. The current bottleneck is, and will continue to be for the foreseeable future, the overseas reception capability. For instance, the United States Army, Europe has stated they cannot handle 600-700 containers per month in peacetime, let alone the significantly increased wartime requirement.[12] As mentioned earlier, if the battlefield happens to be in the more remote parts of Southwest Asia, we will not have ports--we will have to bring the containers in over the beach. The following is a direct quotation from the September 1985 Joint Ammunition Logistics Plan: "In the operation of fixed port facilities, rail head operations, staging areas, and intermediate transportation from a LOTS port, it is expected to use Host Nation Support (HNS), but this support has no facilities or capabilities to deal with an NBC environment. In the event of contamination of any of these areas, the materiel throughput will be severely restricted. US Army assumption of this role after the area has been contaminated will be difficult since the Host Nation equipment in place is not designed to be decontaminated. The primary transport for Class V must remain rail transport between the port and the CSA. Since these facilities are supplied under HNS, their availability cannot be assured."[13] This was quoted to demonstrate how we have failed to really assess the problem. Let's forget the NBC environment and get to the real basics. We have a lot of ammunition to move yet in Southwest

Asia, we probably will not have a port, a railhead, and possibly not even have roads.

We have a Material Handling Equipment (MHE) problem in that containers affect ammunition supply in that more MHE and engineering support is required. The use of containers to transport ammunition will increase in the future, and presently, the ability to unstuff containers at the ASP is severely limited. Moving containers from the truckbed to the ground and back to the truckbed is time consuming unless proper MHE is available. The ammunition companies currently do not have the proper MHE to do the job. The Army is developing a 6,000 lb. Variable Reach Forklift to unstuff containers. The problem is we do not have the equipment now if we had to go to war. The second problem is that we do not train on bringing ammunition over the beach. This is essential in order to develop skills as well as to determine how many ammunition and transportation companies we will need to support such operations.

PRODUCTION BASE

There were few ammunition shortages during the time of the DRAGOON Operation that could be contributed to the production base. There were some shortages of the larger artillery projectiles but these had no signficant impact on the operation. Much of today's production base is World War II vintage that has been modified/improved. Numerous plants have been shut down. Although a detailed study of the production base is not within the scope of this paper, it was apparent from the research done that the current production base could not supply enough ammunition to support a two-front war.

This is primarily based on the fact that consumption rates can be expected to be 8 to 25 times as great as in World War II. The September 1985 Joint Ammunition Logistics Plan even outlines some specific production base shortfalls as follows:

-- RDX/HMX Production. There is a projected shortfall in production capacity for RDX/HMX explosive fill which impacts production of several different munitions in a mobilization condition.

-- ICM Metal Part Production. There is a projected shortfall in production of metal parts for ICM submunitions. The shortfall would impact the 155mm M483 projectile, on the Multiple Launched Rocket System.

-- LAP for Large Munitions. There is a mobilization shortfall for large munitions, i.e., mortars, heavy artillery, and Navy gun munitions.[14]

....and, unfortunately, more.

ORDNANCE PERSONNEL AND TRAINING

In reviewing After Action Reports from the DRAGOON Operation, numerous complaints were reported as to the mental capacity of personnel assigned to ammunition companies--the fact that these personnel were generally in the lower three categories of the Army General Classification Test Groups and that they had problems in providing accurate stock control. Fortunately, the caliber of our Ordnance soldier today is outstanding and getting better. A few comments on training these outstanding soldiers is appropriate. Colonel Bruce Medaris, Ordnance officer for the First US Army

(later a major general), stated the following in a letter to Colonel N. M. Lynde, Ordnance Officer, the General Board:

> With respect to ammunition troops, the greatest training lack encountered has to do with the accurate accounting for stocks on hand. This, in turn, is the result of insufficient training in handling ammunition in and out of ASP's under all condition of weather and light and darkness and with peak loads and varying demands. It is also traceable in some part to not providing sufficient intelligent personnel in ammunition companies for maintaining the records. Ammunition supply is simple if you know all the time just how much you have and where it is.[15]

The lesson for today is our soldiers must know both manual and automated methods of stock control. We cannot count on the automation we get comfortable with in peacetime to work in war. We also must train our ammunition companies to move large quantities of ammunition under all conditions--to include beaches. This is difficult in that few units get to work large quantities of ammunition in field conditions. Few units have enough training ammunition to practice with.

Military training of ordnance troops beyond basic individual training was considered wasteful by most ordnance officers without any combat experience since they considered it rare that ordnance units would engage the enemy. However, combat experienced ordnance officers found that military training helped make better units and prepared units for the unlikely event they had to engage the enemy. The following quotes are significant to support the argument for military (tactical) training. Memorandum to Major B. L. Bratton from Major C. F. Lincoln, Assistant Ammunition Officer,

Fifteenth US Army, formerly Operations Officer, 71st Ordnance Group from D-Day to VE Day, 12 September 1945.

> Tactical training proved valuable to the 57th Ordnance Ammunition Company insofar as it pertains to rifle marksmanship. In an engagement with approximately 55 SS grenadiers, the 57th Ordnance Ammunition Company inflicted 39 fatal casualties and wounded the remainder at the cost of one dead and one wounded.[16]

Remarks of Colonel T. H.Nixon, Ordnance Officer, Third US Army throughout the European Campaign:

> Military training definitely should not be eliminated in the training of an Ordnance soldier. I remember an Ordnance unit coming into Normandy parked its vehicles in the middle of a field; dug foxholes in the middle of a field; pitched tents in the middle of fields, and did not take advantage of hedgerows, natural camouflage, which were available to them. Ordnance soldiers should know how to protect themselves, how to set up a defense of their area. Soldiers should be trained not only in offensive tactics but in defensive tactics as well. In time of war there are occasions when a unit has to retreat. An Ordnance soldier, well trained in military subjects, would not beocme panicky at such a time but would retreat swiftly and orderly, thereby saving many lives.[17]

The bottom line is that we must train as we are going to fight--that may mean that we have no ports, no railhead, and no roads. Ordnance soldiers need to practice moving large quantities of ammunition under such conditions--24 hours a day. The author is convinced that if such realistic training were to be conducted, the Tables of Organization and Equipment for ammunition companies as well as the Army Force Structure could be better tailored to the real needs of the Army.

FORCE STRUCTURE

As the author began this study project, if he had a bias, it was that he was sure that the force structure did not contain enough ammunition units to support an operation such as DRAGOON if we had to do it today. The author thought this would be fairly easy to quantify. The problem became ammunition rates--how many short-tons a division slice could be expected to consume per day. Unfortunately, we do not have accurate consumption rates. As discussed earlier, the rates for a division slice vary from 1,500 short tons/day to 4,500 short tons/day. The TOE 9-38H Ammunition Company can handle the following based upon the two shift/24-hour/ day operation:

In an Ammunition Supply Point Operation: 1,920 S-tons.

In a Corps Support Area Operation: 2,565 S-tons.

What the Army staff has done is allocate one ammunition company per division. This sort of splits the difference of the various "guesstimates" of consumption rates. This appears to be grossly inadequate, based upon:

a. The tremendous increase in the quantity of ammunition required per division (175 S-tons for World War II vs. 1,500 to 4,500 S-tons for today).

b. Containerization is going to require more manhours than break bulk, especially in any over the beach situation. I had the opportunity to command the battalion that received the first PATRIOT missiles in Europe. The missiles were sent over in containers. At the railhead, two containers were placed door-to-door

(for security purpose--the container had to be removed from the trailer to open the door) on 40-foot trailers and moved to the storage area (which happened to be colocated with the corps storage area). Soldiers had to wait three days one time for handling equipment (not organic to the unit) to off-load the containers before they could be unstuffed. Unstuffing an ammunition container is not an easy process. The development community is working the problem of material handling equipment (MHE)--but if we went to war today, we do not have what we need. The lack of MHE as well as the double or triple handling that can be expected if we had to bring ammunition containers over the beach distort the force structure calculations. During this study of tne DRAGOON Operation, it was obvious that by D+2 and D+3, the ammunition troops were nearly exhausted. They were lucky they did not have to deal with containers--we will need more people if we go to war today.

c. Finally, we must plan on over-the-shore operations where there are no railroads or highways. Again, this will make ammunition operations much more labor intensive. Unfortunately, the author was not able to quantify this--but it is the way it will happen and we must prepare for it.

FM 9-38 has some interesting quotes which emphasizes the problems outlined above. When describing TOE 9-38, the conventional ammunition company, FM 9-38 states: "The TOE 9-38 company can lift 1,920 tons per day, working 24 hours in two shifts when operating a forward ASP. The company can lift 2,565 tons per day when operating a rear ASP or CSA 24 hours in two shifts. It is the

primary operating unit in the current structure. It is not adequately manned and equipped to operate in more than one location, but it is usually required to do so."[18] Although this is not bad in itself, when coupled with the following additional comments from FM 9-38, the problem quickly jumps out at one if looking at an across the beach operation in remote parts of Southwest Asia: "The unit currently has no MHE designed to handle containers or to operate inside of a container. If the unit must handle containers at the ASP, a field expedient must be used to unstuff the containers."[19] Additionally, FM 9-38 adds: "The company must depend on: TAACOM Materiel Management Center (MMC) or COSCOM MMC for supply management of stock control. Corps or theater transportation support to relocate the unit. The company is 30 percent mobile (less stocks) in TOE transportation."[20] Again, the vulnerability is obvious--the company has no MHE to handle containers, must have an MMC for stock control, and must have external transportation to move. This is hardly what we can call readiness to go to war.

ORGANIC TRANSPORTATION

As mentioned above, the ammunition company is only 30 percent mobile--less ammunition stocks. Throughout the numerous after-action reports from the DRAGOON Operation, ordnance leaders stated that ammunition companies needed organic tractor-trailer rigs for inter-ASP movement of stocks as well as, at times, to move munitions forward. For instance, to free up the DUKW's, ammunition was off-loaded on the beech and then loaded upon trucks to move to dumps (ASPs) just off the beach. There were situations where the

DUKW's had to move the ammunition off the beach because of the shortage of trucks. Ammunition companies require tractor-trailers for their day-to-day peacetime and wartime ASP movements. It is very inefficient to be totally dependent on external transportation support, even for such small operations as rewarehousing. The presence of organic transportation would make the units much more flexible in wartime.

Stock Accounting

Ammunition units must know what kinds of ammunition they have, how much they have, and where it is. This is what stock accounting is about. During the DRAGOON Operation, ammunition units had major stock accounting problems, primarily attributed to the lower mental category soldiers that were assigned to ammunition units. We have improved the quality of soldiers but have created new problems. Our stock accounting personnel are all being trained on the automated system only. As stated earlier, FM 9-38 says that ammunition companies are dependent upon TAACOM MMC or COSCOM MMC for supply management of stock control.[21] They are not likely to have this ADP support on a remote beach in Southwest Asia or Central America. The Standard Army Ammunition System (SAAS) works well in a sterile environment but does not have the "spirit of the bayonet" for operations in remote and hostile battlefields. We must ensure ordnance units are trained to perform accurate stock accounting and reporting with both automated and manual systems. We cannot afford to use the excuse that we lost the war because the computer was down.

PLANNING

Planning for a large scale operation such as DRAGOON is a difficult task. The DRAGOON Operation involved allies (France and the United Kingdom) as well as other Services making coordination and cooperation essential. Although the campaign was a success, there were a number of deficiencies that we should learn from. Some lessons learned are:

a. Plans must be flexible. Planners should think positively. Planners had anticipated stiff enemy resistance from the German 19th Army that never materialized. This changed the initial assault from an ammunition intensive operation directly into a pursuit/ exploitation operation that results in low ammunition consumption but is petroleum intensive. Later, when 6th Army Group had pursued the enemy some 400 miles, they reached the "west wall." In order to breach the wall, large quantities of ammunition were required. The planning did account for these changes. Initially, ammunition was on the top of all ship loads. When the operation sort of by-passed the assault phase and went directly into pursuit, the ammunition had to be moved in order to get to more urgently needed supplies. Upon reaching the "west wall," combat operations had to be delayed until ammunition stocks could be brought forward in the required quantities. Plans should have provisions to exploit success as well as provisions to handle setbacks.

b. Conscientious decisions must be made on the necessity to interdict targets that may be critical to the next phase of the

campaign. In France, we virtually destroyed the French rail system prior to both the Normandy and the southern France operations. Both operations had breakouts that advanced rapidly into France. The DRAGOON Operation moved 400 miles inland in less than 30 days. The rail network was essential to supplying the invading armies. If the assault phase could have been successful without destroying things like port facilities, railroads, bridges, etc., then destruction should be avoided. If they must be destroyed to ensure operational success, so be it, but planners must plan alternatives and commanders must understand the logistical consequences.

Logistics planners knew from the start that ports were a limiting factor. The problem was never solved until the major port in the north, Antwerp, became operation--yet prior to its capture more and more troops were introduced, multiplying the logistics problem. An exasperated logistician planning for OVERLORD summed up his frustrations in a parody of the invasion plan known as "OPERATION OVERBOARD." "The general principle," he wrote, "is that the number of divisions required to capture the number of ports required to maintain those divisions is always greater than the number of divisions those ports can maintain."[22]

CONCLUSIONS

Operation DRAGOON was both a combined and a joint operation. It was a major invasion that was highly successful. Although this paper points to many of the difficulties experienced during the operation, this was done in order to highlight problems we still

have today and must fix. The logisticians who orchestrated the DRAGOON Operation did an outstanding job--we won!

The overall campaign was a success in that it enabled the Supreme Allied Commander to consolidate his position in late 1944 and it is unlikely that allied forces in France would have been able to mount their final offensive into Germany in 1945 without the heavy contribution of ammunition and other supplies through southern France.

This paper highlighted nine areas where there were significant ammunition logistical problems during Operation DRAGOON and where we still have problems. The real problem is that we we had to support a war in Europe and also open a new front, say in Southwest Asia, we would not be able to do the job today as successfully as we did in Operation DRAGOON in 1944, if we could do the job at all. We have the quality soldiers, but perhaps are suffering from too much management. We need leaders who will accept accurate ammunition rates and, based upon these rates, ensure we have the force structure and production base required to support the varied contingencies that might arise. We need more trucks and less ADP. We need to train as we are going to have to support these contingencies. We must quickly get the required MHE that is in development into the field and then train hard with it.

When we look at the DRAGOON Operation and look at today's Army, we quickly see that requirements are so gigantesque that they have outrun our experience--very careful considerations must be placed in terms of logistical considerations, as expressed in the

ammunition questions, and the manner in which operational level commanders and CINC's conduct their campaigns.

ENDNOTES

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2. Carl R. Morin, Jr., The Strategic Considerations of the Allied Invasion of Southern France, 1944, p. 35.

3. Omar N. Bradley, Bradley, A Soldier's Story, p. 219.

4. FM 9-6, Ammunition Supply, War Department Field Manual, 15 June 1944, p. 5.

5. Major General Royal B. Lord, Colonel W. M. Tenney, Lieutenant Colonel Earl R. Chase, and Major Wayne H. Lee, Report of the General Board, United States Forces, European Theater, Supply and Maintenance on the European Continent, Study Number 130, undated, p. 52.

6. Morin, p. 39.

7. Colonel Nelson M. Lynde, Chief. Ordnance Section, and Captain Roger C. Hawley, Report of the General Board, United States Forces, European Theater, Ammunition Supply and Operations, European Campaign, Ordnance Section, Study Number 100, undated, p.16.

8. Morin, pp. 60-61.

9. Colonel Emil J. Brominski, "USAREUR Ammunition Management Plan," Army Logistician, March-April 1987, p. 12.

10. Lieutenant Colonel Roy R. Willis, An Analysis of Logistical Impacts of Precision Guided Projectiles and Terminally Guided Sub-Munitions, p. 1.

11. Ibid., p. 8, Figure 2.

12. Joint Ammunition Logistics Plan, Project Manager Ammunition Logistics, Dover, NJ, and DRADOC Munitions Systems Manager, Huntsville, AL, September 1985, pp. VI-2.

13. Ibid., pp. VI-2 and 3.

14. Ibid., pp. III-1 and 2.

15. Lynde and Hawley, Appendix 4, pp. 1, 2.

16. Colonel Nelson M. Lynde, Chief, Ordnance Section, Lieutenant Colonel Bruce D. Mooring, Lieutenant Colonel Edwin G. Bevan, Captain William J. Loftus, and Captain Roger C. Hawley,

Report of the General Board, United States Forces, European Theater, the Employment of Ordnance Staff Sections, Ordnance Combat Service Units and Ordnance Service Units in the European Campaign, Ordnance Section, Study Number 101, undated, Appendix 10, pp. 1, 2.

17. Ibid., p. 2.

18. FM 9-38, Conventional Ammunition Unit Operations, Headquarters, Department of the Army, 26 February 1982, p. 3-1.

19. Ibid., p. 3-2

20. Ibid.

21. Ibid.

22. Roland G. Ruppenthal, The European Theater of Operations, Logistic Support of the Armies, Volumn II, p. 46.

23. Ibid., p. 124.

24. Willis, Figure 1.

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Note: In addition to the above sources, the author visited the following Department of the Army staff agencies on 11 February 1987:

Office of the Deputy Chief of Staff for Research, Development and Acquisition (ODCSRDA).

Office of the Deputy Chief of Staff for Logistics (ODCSLOG).

Program, Analysis and Evaluation Directorate (PA&E).

Office of the Deputy Chief of Staff for Operations (ODCSOPS).

The author was privileged to meet with some very knowledgeable and dedicated professionals during this visit. The remarks, opinions, and comments collected from the various offices were under a non-attribution policy. Additionally, some unclassified information was obtained from the classified TAA-92 Force Program Review.

ENCLOSURE 1

DEFINITIONS

"A" Frame - Device used as a field expedient in beach operations when cranes were not available in sufficient quantity. Usually attached to an amphibian truck or other vehicle, it could lift approximately 4,000 pounds.

Allocation - (from FM 9-6, dated 15 June 1944). An allocation, allocation of credit, or allocation of ammunition establishes or assigns "ammunition credits." It is the act of obligating, earmarking, or reserving a definite quantity of ammunition at a specified ammunition supply installation for a designated organization. (These terms are often used in the field to refer to the ammunition which is allocated, and when so used, are synonymous with the term "ammunition credit.")

Ammunition Credit - (From FM 9-6, dated 15 June 1944). A definite quantity of ammunition reserved for, and placed at the disposal of, the commander of a designated organization at a specified ammunition installation. An ammunition credit is not established unless actual ammunition is on hand at the specified ammunition installation. An ammunition credit is tangible; it is existing ammunition which has been reserved or earmarked.

Ammunition Installation - (From FM 9-6, dated 15 June 1944). Any organized locality for the reception, classification, storage or issue of ammunition. It is a general term used to designate any such locality.

Ammunition Supply Point (ASP) - (From FM 9-6, dated 15 June 1944). An ammunition supply installation in the combat zone from which most of the issues are made directly to the using units.

ANVIL - The planned 1944 Allied invasion of southern France in the Toulon-Marseilles area.

Day of Supply - (From FM 9-6, dated 15 June 1944). Estimated average expenditure of various items of supply per day in campaign, expressed in quantities of specific items or in pounds per man per day. A day of supply for ammunition is expressed in rounds per weapon per day.

DRAGOON - Allied invasion of southern coast of France, 15 August 1944, planned under the code name ANVIL.

DUKW - Dual drive, 2 1/2 ton, amphibious truck.

Landing Craft - Any vessel used to carry men, equipment, and supplies ashore.

Long Ton - Weight ton (British) of 2,240 pounds.

OVERLORD - Plan for the invasion of northwest Europe, June 1944.

Port or Beach Clearance - The tonnage that may be transported inland daily from a beach or port by available means of inland communication, including highways, railraods, and inland waterways.

Port Capacity - The tonnage that can be discharged daily from ships, based only on evaluation of the physical facilities of the port.

Prescribed Load - (From FM 9-6, dated 15 June 1944). A specified quantity of each type of ammunition to be carried on unit vehicles and by the personnel. The establishement of this load is a command function (currently known as "basic load").

RO/RO - Roll on/roll off.

SHAEF - Supreme Headquarters, Allied Expeditionary Force.

Short Ton - Weight ton (US) of 2,000 pounds.

Status of Stocks Report - (From FM 9-6, dated 15 July 1944). The status of stocks report of an ASP or depot informs Army of the total quantity of each type of ammunition on hand at the ASP or depot, broken down to show the quantity unallocated by Army and the balance available for issue to corps or divisional troops from existing Army allocations to corps.

Unit of Fire - (From FM 9-6, dated 15 June 1944). A unit of measure for ammunition supply within a theater from a tactical point of view, based upon experience in the theater. It represents a specified number of rounds per weapon, which varies with the types and calibers of the weapons. The unit of fire is not synonymous with the term "day of supply." In general, it represents a balanced expenditure by the various weapons under conditions of normal action. The unit of fire prescribed by the War Department may be modified by theater commanders as necessary for each individual theater.

ENCLOSURE 2

SOUTHERN FRANCE LOGISTICAL SUPPORT OF ALLIED ARMIES[a]

		Percentage of ETO Total	Rank Among ETO Parts
Personnel Debarked:	905,512[c]	24	2d
Tonnage Discharged:	4,122,081	27	1st
Vehicles Debarked:	172,331	27	1st

a = 6 June 1944 to 8 May 1945

b = long tons (see definition at Enclosure 1)

c = French and US

Source: The Historical Report of the Transportation Corps, Vol. VII, pt 3, Section titled: Consolidated Statistics of Transportation Corps Operation in the ETO. Cited in "The Administrative and Logistical History of the ETO," Pt. VIII: "Supplying the Armies" (MS, Office, Chief of Military History, 1946, p. 42).

ENCLOSURE 3

TONNAGES DISCHARGED AT CONTINENTAL PORTS: JUNE 1944 - APRIL 1945[23]
(Long Tons, Exclusive of Bulk POL and Vehicles)

Year and Month	Total	Omaha Beach	Utah Beach	Cherbourg	Normandy Minor Ports	Brittany Ports	Le Havre	Rouen	Antwerp	Ghent	Southern France
1944											
June	291,333	183,199	109,134	---	---	---	---	---	---	---	---
July	621,322	356,219	193,154	31,659	40,291	---	---	---	---	---	---
August	1,112,771	348,820	187,955	266,644	125,353	9,499	---	---	---	---	---
September	1,210,298	243,564	150,158	314,431	100,126	75,198	---	---	---	---	174,500
October	1,309,184	120,786	72,728	365,603	58,836	77,735	61,731	26,891	---	---	326,813
November	1,402,080	13,411	12,885	433,301	42,737	64,078	148,654	127,569	5,873	---	547,602
December	1,555,819	---	---	250,112	50,749	27,327	166,038	132,433	427,592	---	501,568
1945											
January	1,501,269	---	---	262,423	47,773	---	198,768	157,709	433,094	15,742	385,760
February	1,735,502	---	---	286,591	41,836	---	195,332	173,016	473,463	69,698	495,566
March	2,039,778	---	---	261,492	39,691	---	192,593	268,174	558,066	172,259	547,903
April	2,025,142	---	---	181,043	47,542	---	165,438	240,708	628,227	277,353	484,631

ENCLOSURE 4

MAJOR WEAPON DENSITIES AND FIRING RATES[24]

Type	Number of Weapons		RDS/WPN/DAY		
	Inf Div (1945)	Mech Div 86	Inf Div (1945)	Mech Div 86 Intense	Mech Div 86 Light
60mm Mortar	81	0	7.5	0	0
81mm Mortar	27	0	8	0	0
107mm Mortar	0	66	0	240	94
105mm How Towed	36	0	20	0	0
105mm How SP	75 — 27	0	20	0	0
155mm How	12	72	10	510	166
8 in How	0	12	0	388	118
57mm Recoilless	81	0	5	0	0
75mm Recoilless	27	0	6	0	0
Dragon Lchrs	0	204	0	6	2
Tow Lchrs	0	121	0	12	4
90mm Gun Tk	27	0	9	0	0
105mm Gun Tk	∪	232	0	85	21
MLRS Lchrs	0	9	0	NOT AVAILABLE	
Total	318	716			

END

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